CLAIMS:

We claim:

1. A process to produce a multimodal polyolefin in a single reactor comprising:

- a) continuously combining a catalyst component slurry with a catalyst component solution to form a catalyst composition;
- b) combining the catalyst composition with one or more olefin(s) in a polymerization reactor to form a multimodal polyolefin;
- c) measuring a sample of the multimodal polyolefin to obtain an initial multimodal polyolefin property;
- d) changing the amount of catalyst component solution combined in (a) relative to the amount of catalyst component slurry to obtain a second product property; and
- e) isolating the multimodal polyolefin product;

wherein the catalyst component slurry comprises one or more catalyst compounds, one or more activators and one or more support materials; and the catalyst component solution comprises one or more catalyst compounds, wherein the catalyst compounds may be the same or different.

- 2. The process of Claim 1, wherein the catalyst component slurry comprises a first catalyst compound and the catalyst component solution comprises a second catalyst compound.
- 3. The process of Claim 2, wherein the first catalyst compound is a Group 15 containing metal compound and where in the second catalyst compound is a bulky ligand metallocene compound.
- 4. The process of Claim 2, wherein the molar ratio of the first catalyst compound to the second catalyst compound in the catalyst composition is between about 500:1 to about 1:500.

5. The process of Claim 1, wherein the polyolefin property is selected from the group consisting of flow index (I₂₁), melt index (I₂), density, MWD (M_w/M_n), comonomer content, and combinations thereof.

- 6. The process of Claim 1, wherein polyolefin property is flow index (I_{21}) .
- 7. The process of Claim 1, wherein the reactor is a gas phase fluidized bed reactor.
- 8. The process of Claim 7, wherein the reactor temperature is from 60 to 115°C.
- 9. The process of Claim 1, wherein the catalyst composition is passed through an injection tube extending into the reactor a distance of 0.25 cm to 3.1 m.
- 10. The process of Claim 1, wherein the catalyst composition is passed through an injection tube extending into the reactor a distance of 5 cm to 1.5 m.
- 11. The process of Claim 9 or 10, wherein a carrier stream comprising an alkane is contacted with the catalyst composition prior to passing through the injection tube.
- 12. The process of Claim 11, wherein the carrier stream further comprises a carrier gas.
- 13. The process of Claim 1, wherein the catalyst component slurry comprises mineral oil.
- 14. The process of Claim 1, wherein the polyolefin product is a multimodal or bimodal polyethylene comprising a high molecular weight fraction and a low molecular weigh fraction; the polymer product having a density of from 0.930 g/cc to 0.965 g/cc and a Mw/Mn of from 20 to 50.
- 15. The process of Claim 1, wherein the polyolefin product is a multimodal or bimodal polyethylene comprising a high molecular weight fraction and a low molecular weigh fraction; and wherein the weight percent ratio is higher than 10 and less than 30.

- 16. The process of Claim 1, wherein the polyolefin product is a multimodal or bimodal polyethylene comprising a high molecular weight fraction and a low molecular weigh fraction; and wherein the weight percent ratio is higher than 15 and less than 25.
- 17. The process of Claim 1, wherein the multimodal polyolefin is separated into fractions according to the following table:

Sieve size	Fraction Collected	Fraction
		Name
10 mesh	> 2000 μm	Fraction 1
18 mesh	2000- 1000 μm	Fraction 2
35 mesh	<1000 - 500 μm	Fraction 3
60 mesh	<500-250 μm	Fraction 4
120 mesh	<250 -125 μm	Fraction 5
200mesh/Pan	<125 μm	Fraction 6

and the melt indices of Fractions 3, 4 and 5 do not vary by more than 30% relative to each other.

18. The process of Claim 3, wherein the Group 15 containing catalyst compound is represented by the formulae:

$$R^{3}$$
 L
 R^{1}
 R^{2}
 R^{2}
 R^{5}
 R^{7}
Formula I or

$$\begin{array}{c|c}
R^4 & R^6 \\
R^3 & L'_{X} & M^{n}X_{n-2} \\
Z & R^7 \\
R^5 & R^7
\end{array}$$

Formula II

wherein

M is a Group 4, 5, or 6 metal;

each X is independently a leaving group;

y is 0 or 1, wherein when y is 0, group L' is absent;

n is the oxidation state of M;

m is the formal charge of the ligand represented by YZL and YZL';

L, L', Y and Z are each a Group 15 element;

- R^1 and R^2 are independently a C_1 to C_{20} hydrocarbon group, a heteroatom containing group having up to twenty carbon atoms, silicon, germanium, tin, lead, halogen or phosphorus;
- R³ is absent or a hydrocarbon group, hydrogen, a halogen, a heteroatom containing group;
- R⁴ and R⁵ are independently an alkyl group, an aryl group, substituted aryl group, a cyclic alkyl group, a substituted cyclic alkyl group, a cyclic arylalkyl group, a substituted cyclic arylalkyl group or multiple ring system;
- R⁶ and R⁷ are independently absent, or hydrogen, an alkyl group, halogen, heteroatom or a hydrocarbyl group; and
- R* is absent, or is hydrogen, a Group 14 atom containing group, a halogen, or a heteroatom containing group.
- 19. The process of Claim 3, wherein the bulky ligand metallocene catalyst compound is represented by the following formulae:

L^AL^BMQ_n or L^AAL^BMQ_n

wherein M is a Group 4, 5 or 6 transition metal;

bulky ligands L^A and L^B are each bound to M and are unsubstituted or substituted cyclopentadienyl ligands or cyclopentadienyl-type ligands, heteroatom substituted or heteroatom containing cyclopentadienyl-type ligands;

Q is a monoanionic labile ligand; wherein each Q is bound to M; A is a divalent bridging moiety bound to each of L^A and L^B ; and n is 0, 1 or 2

- 20. The process of Claim 1, wherein the support material is fumed silica.
- 21. A film, pipe or blow molded product comprising the multimodal polyolefin of Claim 1.